Chapter 9 Superelevation

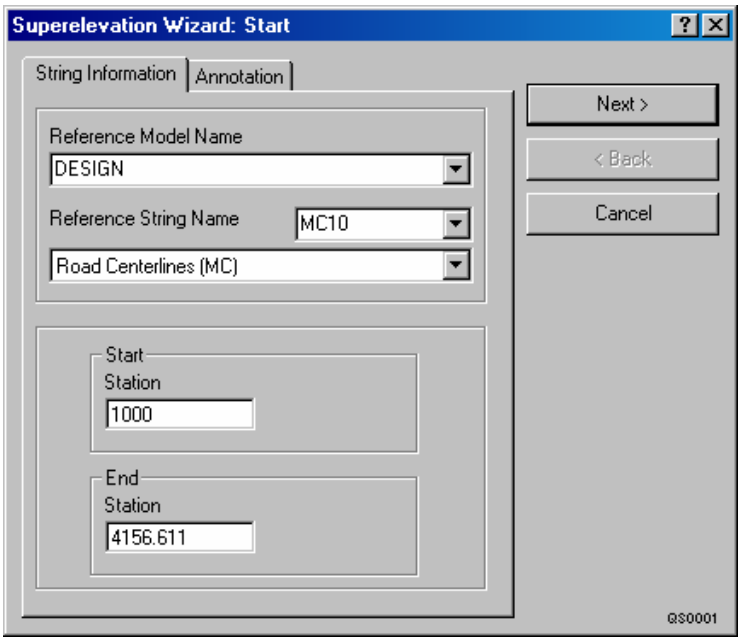
Superelevating The Roadway using Rule-Based Superelevation

Before any shoulders are added to the roadway, you should determine what your superelevations should be. You can do this manually, and create an INPUT file to amend the travelled way strings, or you can use the MXRoad Superelevation Wizard to automate this process. The following procedure takes you through the wizard:

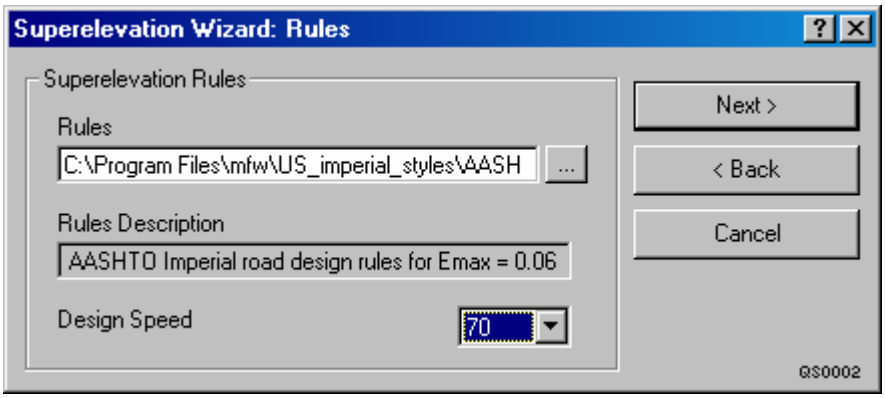
Step 1. Start the Superelevation Wizard by selecting ***Design***, ***Road Design***, then ***Rule-Based Superelevation*** from the menu bar.

Step 2. The following panel will appear:

Select the Reference Model and Reference string from the drop-down boxes, or by clicking on your M-String in the display area. You can also specify station limits here to superelevate only a portion of your roadway, or to superelevate different sections of your roadway using different rules. (i.e. Rural, Urban, etc.). Click ***Next*** to continue.



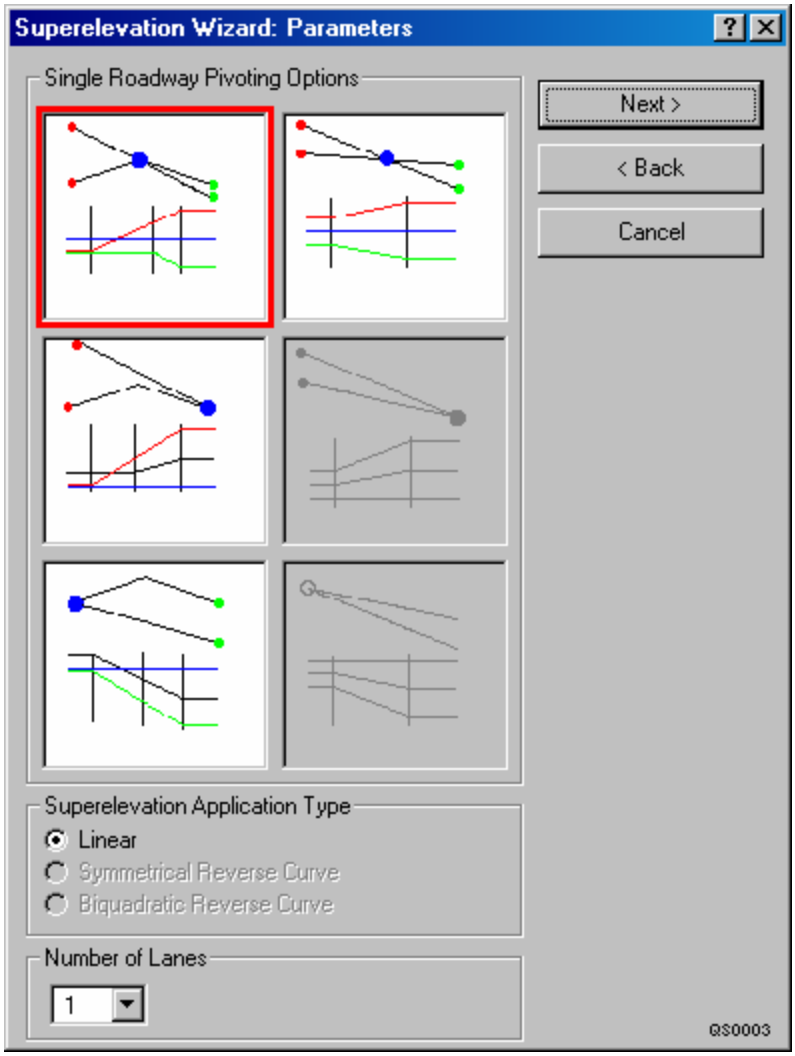
Step 3. Specify which superelevation rules (tables) and the design speed you want to use in the following panel:



Click ***Next*** to Continue.

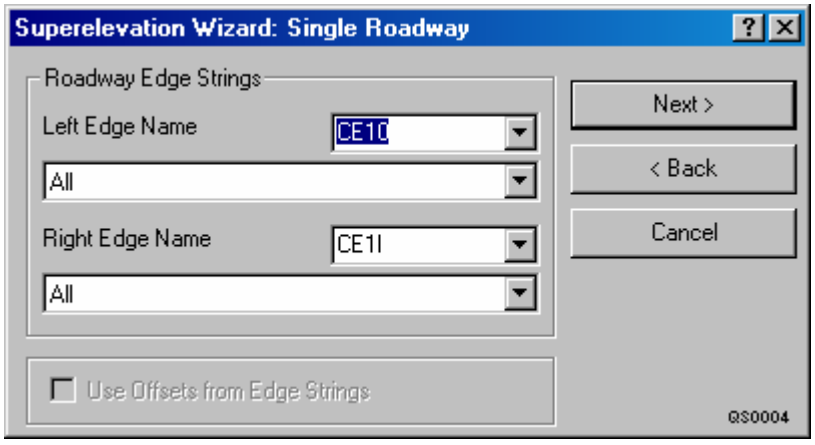
Step 4: Select the Pivot Method, which you want to use to transition your roadway from normal crown to superelevated conditions:

The blue dot indicates the pivot point. Click ***Next*** to continue

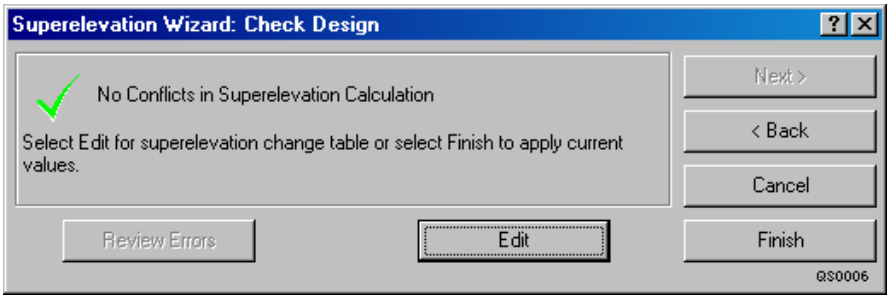


Step 5: Select the application type: For the single cambered road, only linear application is available.

Step 6: Specify the roadway edge strings.

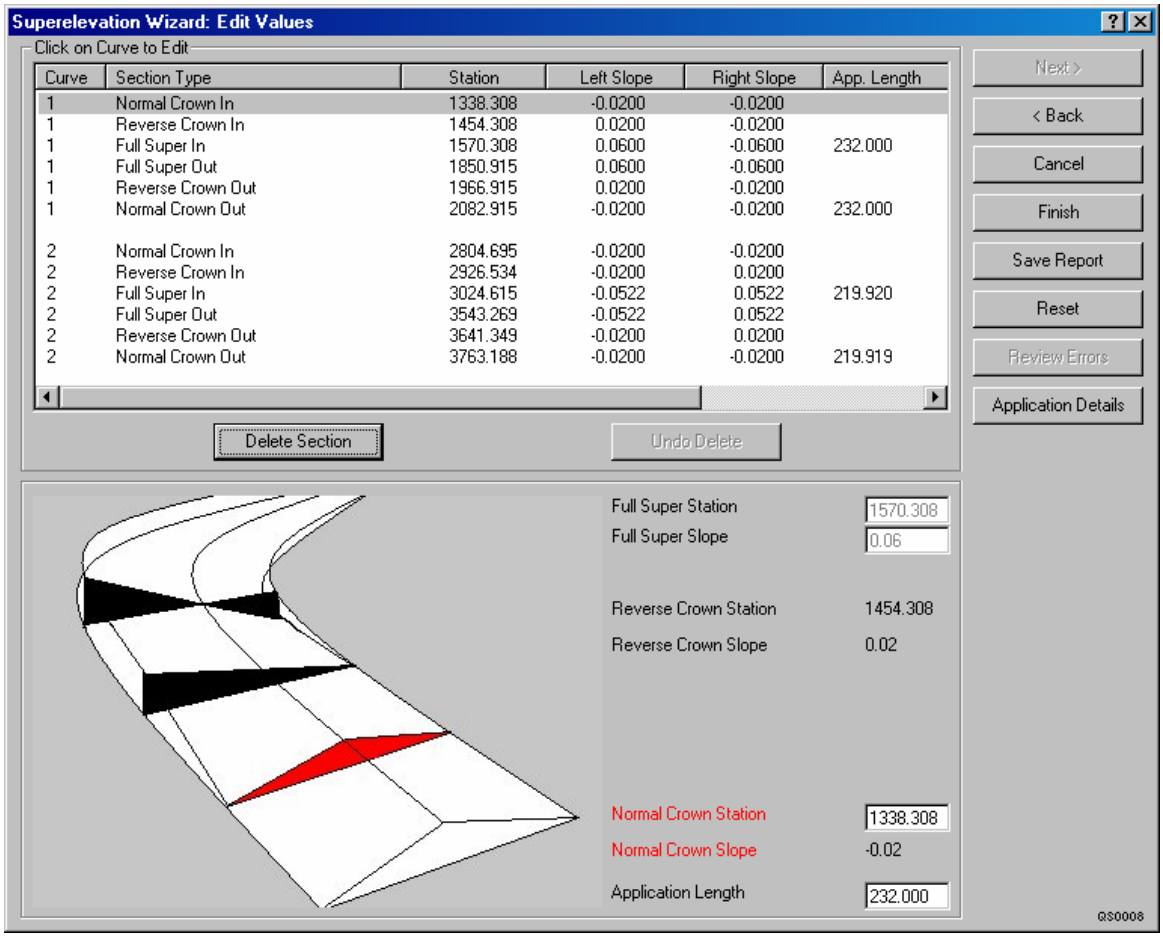


Step 7: After specifying the roadway edge strings, calculations are done. If any errors occur, you will be prompted to change certain values, such as the design speed. If no errors are found in the computations, the following panel will appear:



It's a good idea to review the values that were automatically calculated before accepting them. You also can modify them if you desire. Click on the Edit button to see a table of the superelevation values.

Step 8: The table shown on the Edit Values panel provides details on the way superelevation has been applied. You can adjust these values as necessary. Here's what the table looks like:



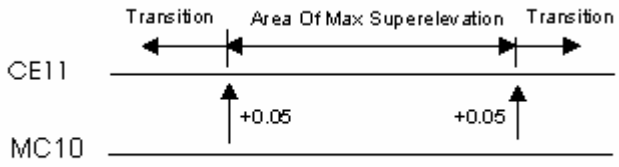
Step 9: Click Next to accept these values, then click Finish to apply the superelevation and exit the wizard.

Superelevation of the Roadway with an INPUT File:

The Wizard described above uses the following Major Option DESIGN Commands, which can be written in an INPUT file format:

Minor Option 130; Amend Levels: Constant Crossfall

This minor option is used to amend the levels of a section of a string by the application of crossfall relative to another string. This is the command used to apply full superelevation to the edge of traveled way strings on highway curves. Because it applies a constant crossfall, it is only used for the section of the roadway where maximum superelevation is held constant. The superelevation transition areas are amended using Minor Option 131, Amend Levels: Linear Crossfall.



In the drawing above, the center section was originally created with a normal cross slope of -0.02. The levels of that section of CE11 are amended so that the cross slope is +0.05. The command line to accomplish this is:

```
130,MC10,,CE11,,ssta,,+0.050,esta
```

When amending levels using the 130, or 131 Minor Options, the "ssta" and "esta" in the command lines should be replaced with the start station and ending station for the option to be applied.

The field definitions for this command are:

```
* Field 1   Reference string.

  Field 2   Subsidiary string (optional)

* Field 3   String to be amended.

  Field 5 & 6     SPRD start.

* Field 7   Constant crossfall to be applied
  Field 8 & 9     SPRD end.
```

Minor Option 131; Amend Levels: Linear Crossfall

This minor option is used to amend the levels of a section of a string by the application of crossfall relative to another string. This is the command used to accomplish the transition from normal cross slope to full superelevation as you enter a superelevated section, and then to return back from full superelevation to normal cross slope. An example of the command line is as follows:

```
131,MC10,,CE11,,ssta,,-0.020,esta,,+0.050
```

The above command line will amend the levels of string CE11 beginning at "ssta" with cross slope of -0.020, and linearly amend these levels through "esta", which will have a cross slope of +0.050.

The field definitions for this command are:

```
* Field 1   Reference string.

  Field 2   Subsidiary string (optional)

* Field 3   String to be amended.

  Field 5 & 6     SPRD start.

* Field 7   Crossfall required at start point

  Field 8 & 9     SPRD end.
  Field 10  Crossfall required at end.
```

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